SONY

MAV-70XGI

MPEG2 SERVER

MPEG IMX

THE BROADCAST SOLUTION FOR MULTI-CHANNEL PLAYOUT

Why A Server?

At a time when broadcasters are seeking greater openness, flexibility, scalability, performance, and reliability from their transmission systems, Sony now offers a next generation MPEG server ready to fulfill the diverse challenges required for DTV.

The MAV-70XGI server has evolved from the continual application of advances in technology, and a recognition that the potential of digital television stretches far beyond traditional services, and encompasses a broader range of skills and technologies with origins in the networking and data storage industries.

MAV-70XGI is the only true broadcast server to offer a real gateway into this new domain. The MAV-70XGI server combines reliability, performance, and quality for 24/7 playout applications, with the flexibility, interoperability, and efficiencies of audio/video networking.

The Power of Compression

Sony also believes that while MPEG2 has been established as the ultimate open compression scheme for the broadcast industry, it also facilitates “open system architectures and interfaces”. This enables the flexibility customers require to be competitive.

Using MPEG2 open compression standards and interfaces with leading software applications – as well as our own, MAV-70XGI will now allow you to choose the best solution most appropriate to meet your individual needs. MAV-70XGI is truly “OPEN for business”.

Sony now offers the next generation MPEG2 server ready to fulfill the diverse challenges required for DTV.

MPEG IMX

MAV-70XGI Features

Versatile MPEG2 Compression

The MAV-70XGI supports the full range of MPEG2 profile and level combinations for SD and HD signals.

- The widely accepted MPEG2 4:2:2: Profile @ Main Level provides a full chroma signal, blending high quality imagery and application versatility with compression efficiency.
- MPEG2 Main Profile @ Main Level provides greater bit rate efficiency while maintaining excellent picture quality. It also includes support for high-definition applications using MPEG2 4:2:2: Profile @ High Level and MPEG2 Main Profile @ High Level with bit-rates of up to 40 Mbps.
- The MAV-70XGI offers clip-by-clip selectable bit-rate in the range 1.5-50 Mbps, and adaptable group of pictures (GoP) structure from long GoP at bit-rates up to 24Mbps to I-frame only compression at higher bit-rates for production applications.
- Additional features include 'Jog' and 'shuttle' style navigation, frame accurate 'trimming' of video material to select exact start and end points, full server control via the network port for remote unattended operation, and clip durations down to single frames held within a unique RAMCache store for immediate access.
- The MAV-70XGI provides excellent picture quality and versatility above any other server in its class by combining the flexibility in MPEG2 and video storage capabilities with Sony's own MPEG2 codec chip technology.

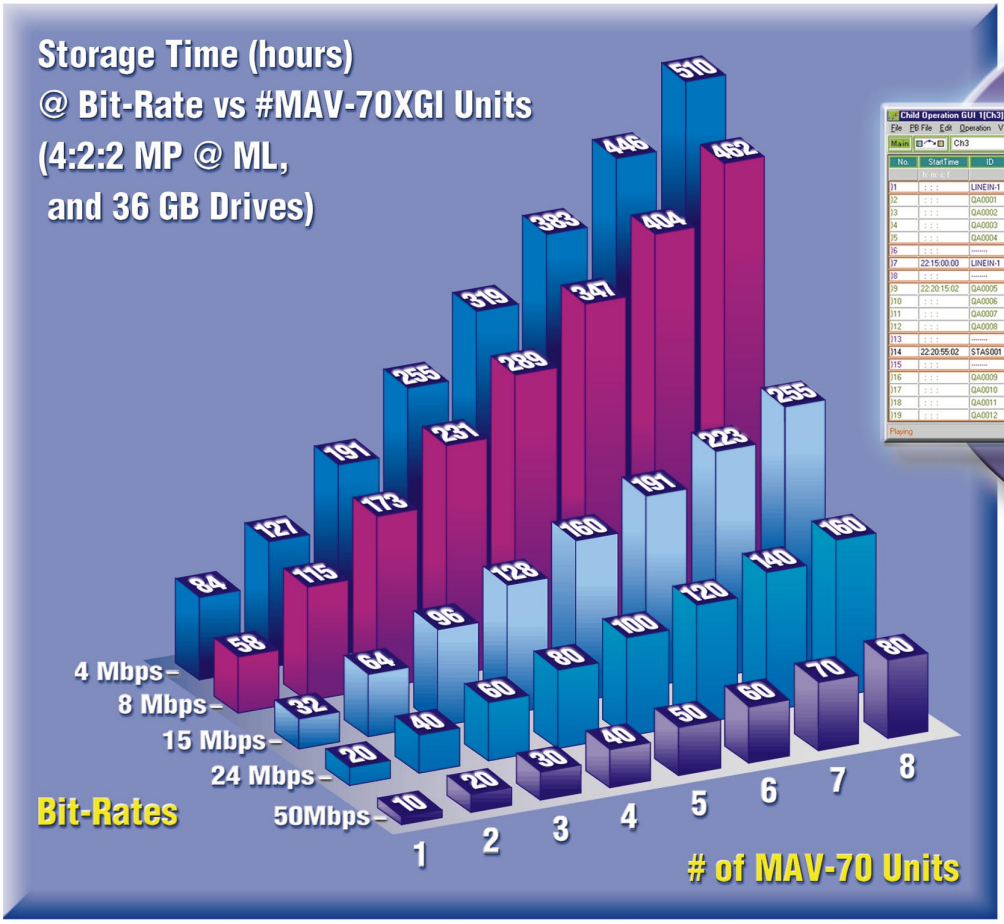
Configurable Inputs/Outputs

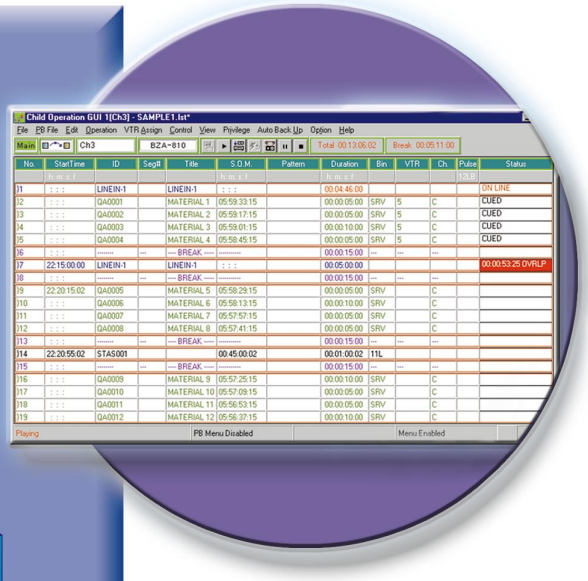
The MAV70-XGI has up to 5 I/O ports available, each configurable either as input, output, or combined input/output board, and is capable of accepting Baseband video (SDI or Analog). For larger I/O requirements multiple server cluster-architectures on a Fibre-Channel network or Gigabit network are possible, offering complete flexibility in channel configuration. The MAV-70XGI also offers DVB/ASI I/Os for multi-vendor connectivity.

In addition, each MPEG2 decoder is fully agile, and will automatically sense and decode the originating MPEG2 compression scheme and bit-rate for each clip across the full range of stream configurations defined by the MPEG2 framework.

Storage Capacity

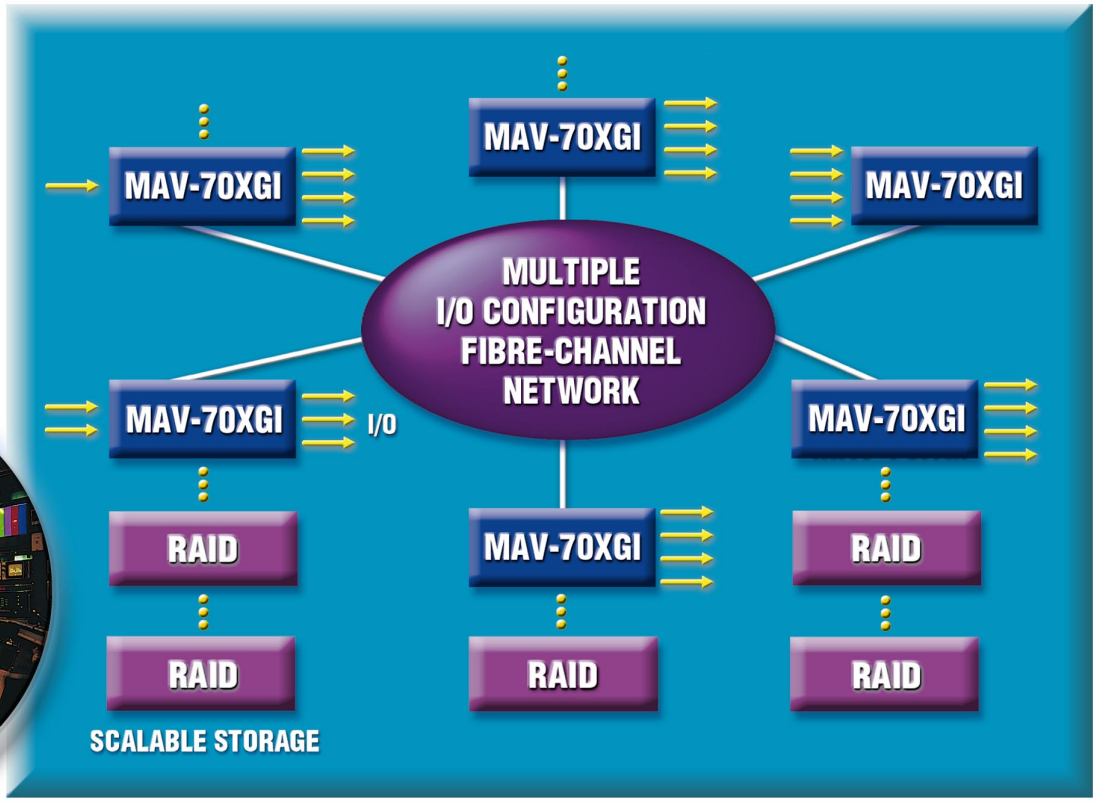
A single MAV-70XGI (the same size as a Betacam® VTR), houses an internal RAID-3 HDD array. For expanded local storage, up to seven additional MAV-70XGI HDD arrays for optimum read/write AV streaming operations can be interconnected over high-speed Fibre-Channel. This flexible structure enables users to build storage from 126 Gbytes to over 2 Tbytes, providing over 300 hours of A/V storage time for material compressed at 8Mbps. Add to this the ability to incorporate MAV-70XGI as part of a larger storage area network (SAN), and the MAV-70XGI is certainly bigger than it looks.





Sony's state of the art MPEG2 technology empowers MAV-70XGI servers with unparalleled flexibility for the selection of bit rates, GoP structures and storage capacity.

Multiple interface technologies of the MAV-70XGI enable a variety of system architectures to suit numerous broadcast applications.



MAV-70XGI Features

Network Connectivity

In addition to real-time (synchronous) material playout, MAV-70XGI offers faster-than-real-time (asynchronous) file transfer over both 100BaseT and Gigabit Ethernet using standard FTP commands. For high-speed inter-server file transfer, Fibre-Channel arbitrated loop (FC-AL) or Gigabit Ethernet file copy is also possible. This enables simultaneous high-speed material exchange between servers across both LAN and WAN, with no impact to I/O port activity providing a Quality of Service (QoS) above any server in its class. The Gateway application also utilizes the latest in network technologies to provide rapid file transfer exchange between servers and data tape mass storage systems.

Reliability

The MAV-70XGI is designed specifically for the demands of the broadcast market. This means reliability is an integral part of the server design; hot-swappable boards, disks, redundant PSUs, and fans are all standard, as is RAID-3 protected HDD with on-line disk re-build in the event of failure, and unique cluster management eliminating disk fragmentation.

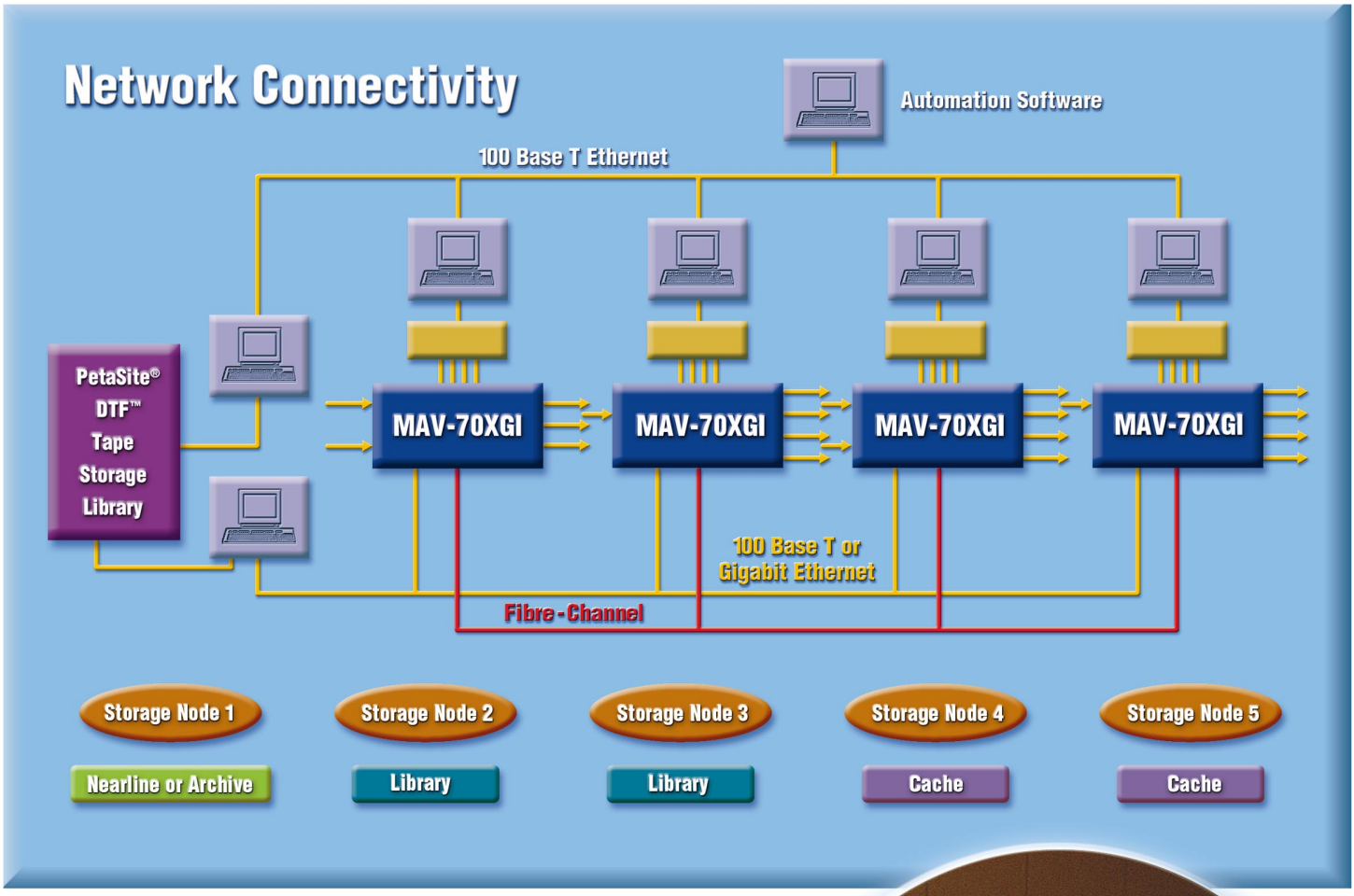
MAV-70XGI does not rely on the performance of a general operating system such as Microsoft® Windows®, but adopts an optimized real-time operating system, offering a greater response speed and faster boot-up time, keeping you on-air.

Open Architecture

The MAV-70XGI offers the advanced Sony open 9-pin disk protocol and Telnet, as well interfacing to Louth VDCP and other automation software packages. This enables the development of control interfaces by software vendors, enhancing the choice and performance of system solutions for any digital broadcast application.

Audio / VBI Support

MAV-70XGI supports eight uncompressed audio channels per video channel as standard (24 bit, 48 kHz), with the option of up to 16 compressed audio channels and supports Dolby® AC-3®, and Dolby E® compression schemes. In addition, Closed Caption Data, Sub Title and VITC are available on user selectable VBI (Vertical Blanking Interval).



An example of a Hierarchical Storage Management (HSM) and Storage Area Network (SAN) solution with the MAV-70XGI.

User Benefits and Application Examples

USER BENEFITS

- In an environment where performance and economy run side-by-side, the MAV-70XGI offers a price-competitive, compact, modular design, with a wealth of features to meet the most demanding of applications.
- Sony compression and storage technology is the most advanced available. So you get MPEG2 industry-standard transmission - and the best pictures in the business.
- RAID-3 storage, hot-swap components, redundant power supplies and fans, optimized disk management.
- Match the bit rate to the application. Network multiple units. Configure each unit to suit your purpose. Expand to meet new demands.
- High-speed file transfer with Fibre-Channel or Gigabit Ethernet. The highest compressed MPEG2 picture quality. Bit streams up to 50 Mbps.
- The storage capacity can be built from 126 GB to over 2 TB with one internal RAID-3 and up to seven additional external units.
- MPEG2 compliant, Digital TV-ready, multiple I/O cluster configurations. Automation control software friendly.
- The MAV-70XGI makes use of the MPEG2 AV compression standards and has been designed to accept the future universal file standard (MXF) standardized at the PRO-MPEG Forum. This provides maximum interoperability with numerous software/hardware manufacturers.

APPLICATION EXAMPLES

Transmission Playout

The MAV-70XGI provides reliable single and multi-channel playout of both short-form (e.g. commercials, promos) and long-form material. With clip-lengths down to single frames, back-to-back operation, and selectable bit-rate compression offering both standard and high-definition, you are prepared for even the most demanding of transmission applications.

Video Distribution & Storage

With scalable storage capacity, standard IT network architectures, and open interfaces (including data tape mass storage/archive systems), MAV-70XGI is ideal for video store-and-forward applications in both synchronous and asynchronous modes, including program/material distribution, and commercial insertion applications.

NVOD

With server cluster-architectures, network file transfer, and multiple high-quality outputs, even at low MPEG2 compression bit-rates, video has never looked so good!

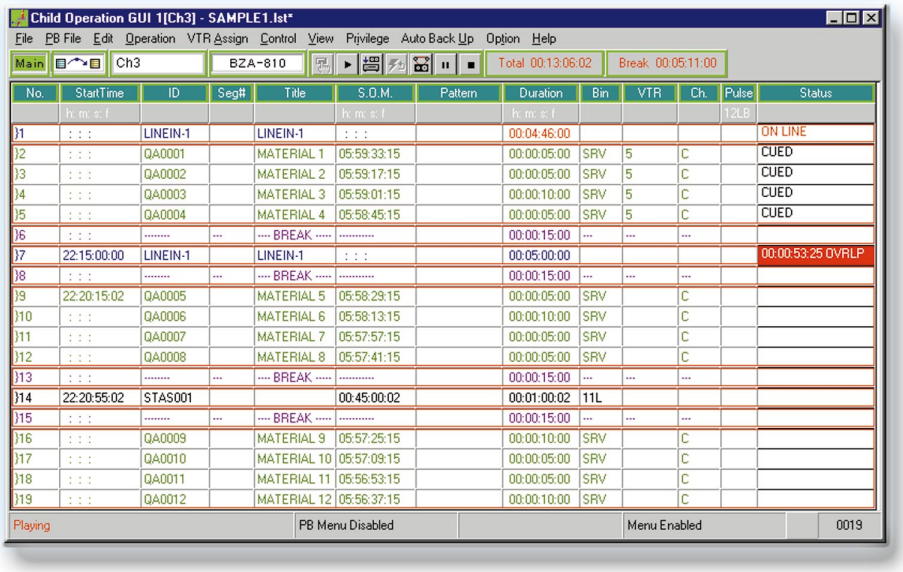
Time Shift and Delay

With a fast response time, optimized disk management, complete frame accuracy (even with long GoP), all within the advanced disk protocol, the MAV-70XGI provides the capabilities to support each video recording for time shift and delay applications.

Disk Recording

The MAV-70XGI offers a competitive price for performance and up to 5 simultaneous I/O plus network interfaces from a single compact chassis. If quality, reliability, and flexibility are required, the MAV-70XGI is the right choice.

The MAV-70XGI was designed to operate under the control of third-party software as well as Sony's own suite of transmission system applications.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File PB File Edit Operation VTR Assign Control View Privilege Auto Back Up Option Help
Main Ch3 BZA-810 Total 00:13:06:02 Break 00:05:11:00
No. StartTime ID Seg# Title S.O.M. Pattern Duration Bin VTR Ch. Pulse Status
}1 LINEIN-1 LINEIN-1 00:04:46:00 ON LINE
}2 QA0001 MATERIAL 1 05:59:33:15 00:00:05:00 SRV 5 C CUED
}3 QA0002 MATERIAL 2 05:59:17:15 00:00:05:00 SRV 5 C CUED
}4 QA0003 MATERIAL 3 05:59:01:15 00:00:10:00 SRV 5 C CUED
}5 QA0004 MATERIAL 4 05:58:45:15 00:00:05:00 SRV 5 C CUED
}6 ---- BREAK ---- 00:00:15:00
}7 22:15:00:00 LINEIN-1 LINEIN-1 00:05:00:00 00:00:53:25 OVRLP
}8 ---- BREAK ----
}9 22:20:15:02 QA0005 MATERIAL 5 05:58:29:15 00:00:05:00 SRV C
}10 QA0006 MATERIAL 6 05:58:13:15 00:00:10:00 SRV C
}11 QA0007 MATERIAL 7 05:57:57:15 00:00:05:00 SRV C
}12 QA0008 MATERIAL 8 05:57:41:15 00:00:05:00 SRV C
}13 ---- BREAK ----
}14 22:20:55:02 STAS001 00:45:00:02 00:01:00:02 11L
}15 ---- BREAK ---- 00:00:15:00
}16 QA0009 MATERIAL 9 05:57:25:15 00:00:10:00 SRV C
}17 QA0010 MATERIAL 10 05:57:09:15 00:00:05:00 SRV C
}18 QA0011 MATERIAL 11 05:56:53:15 00:00:05:00 SRV C
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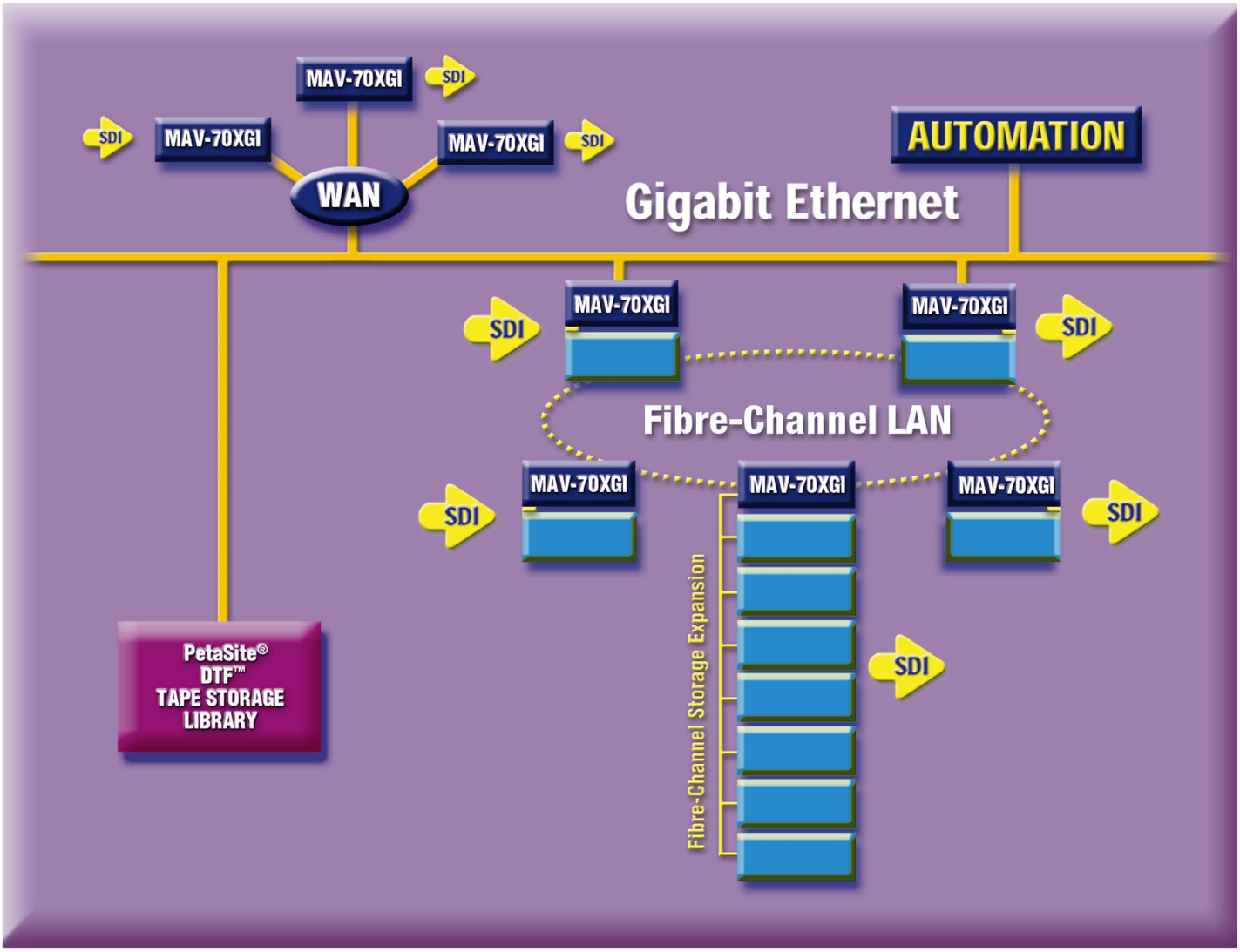


Example of Video Distribution and Storage Application for MAV-70XGI.

MAV-70XGI Server Components

MAV-70XGI, Server Chassis
Main server unit containing 252 GB of RAID-3 storage, System Board, Storage Controller Board, CPU, with optional redundant PSU, and five slots for optional I/O boards. Up to eight MAV-70XGI units can be connected by Fibre-Channel to increase storage of one server to maximum of 2 Tbyte. Multiple servers can be interconnected by Fibre-Channel for file transfer. Greater storage per chassis can be achieved when higher capacity drives become available.

The system board has five independent RS422 control ports supporting Sony Disk Protocol, Louth VDCP and Sony VTR protocol, plus 100BT Ethernet port for network control.

BKMA-7010, SDI Encoder/Decoder Board
Accepts and outputs component digital SDI signal. Supports MPEG2 4:2:2P@ML and MP@ML from 1.5 to 24Mbps long GoP and 30 to 50Mbps I-frame only.

BKMA-7020, MPEG Encoder Board
Accepts component digital SDI and analog signal (with optional BKMA-7050 board fitted). Supports MPEG2 4:2:2P@ML and MP@ML from 1.5 to 24Mbps long GoP and 30 to 50Mbps I-frame only.

BKMA-7021, MPEG Encoder Board w/ 8ch Audio
Accepts component digital SDI signal. Supports MPEG2 4:2:2P@ML and MP@ML from 1.5 to 24Mbps long GoP and 30 to 50Mbps I-frame only.

BKMA-7025, MPEG HD Encoder Board
Accepts component digital HD SDI signal. Supports MPEG2 4:2:2P@HL and MP@HL from 10 to 40Mbps.

BKMA-7030, MPEG Decoder Board
Outputs component digital SDI and analog (with optional BKMA-7060 board fitted). Supports MPEG2 4:2:2P@ML and MP@ML from 1.5 to 24Mbps long GoP.

BKMA-7030/1, MPEG Decoder Board
Outputs component digital SDI and analog (with optional BKMA-7060 board fitted). Supports MPEG2 4:2:2P@ML and MP@ML from 1.5 to 24Mbps long GoP, and 30 to 50Mbps I-frame only.

BKMA-7031, MPEG Decoder Board w/ 8ch Audio
Outputs component digital SDI. Supports MPEG2 4:2:2P@ML and MP@ML from 1.5 to 24Mbps long GoP.

BKMA-7035, MPEG HD Decoder Board
Outputs component digital HD SDI. Supports MPEG2 4:2:2P@HL and MP@HL from 10 to 40 Mbps. 8 ch audio.

BKMA-7040, Fibre-Channel Port Board
Used to interconnect MAV-70XGI for storage expansion and high speed file copy between several MAV-70XGI. Up to eight MAV-70XGI units can be interconnected for storage expansion when each has a BKMA-7040 installed. A total of eight units can be interconnected for file copy with BKMA-7040 installed in each server.

BKMA-7045, Gigabit Ethernet Adapter
An Ultra SCSI interface board and software Gateway application to map high-speed data transfer from the MAV-70XGI to a Gigabit Ethernet network resident on the Gateway host device.

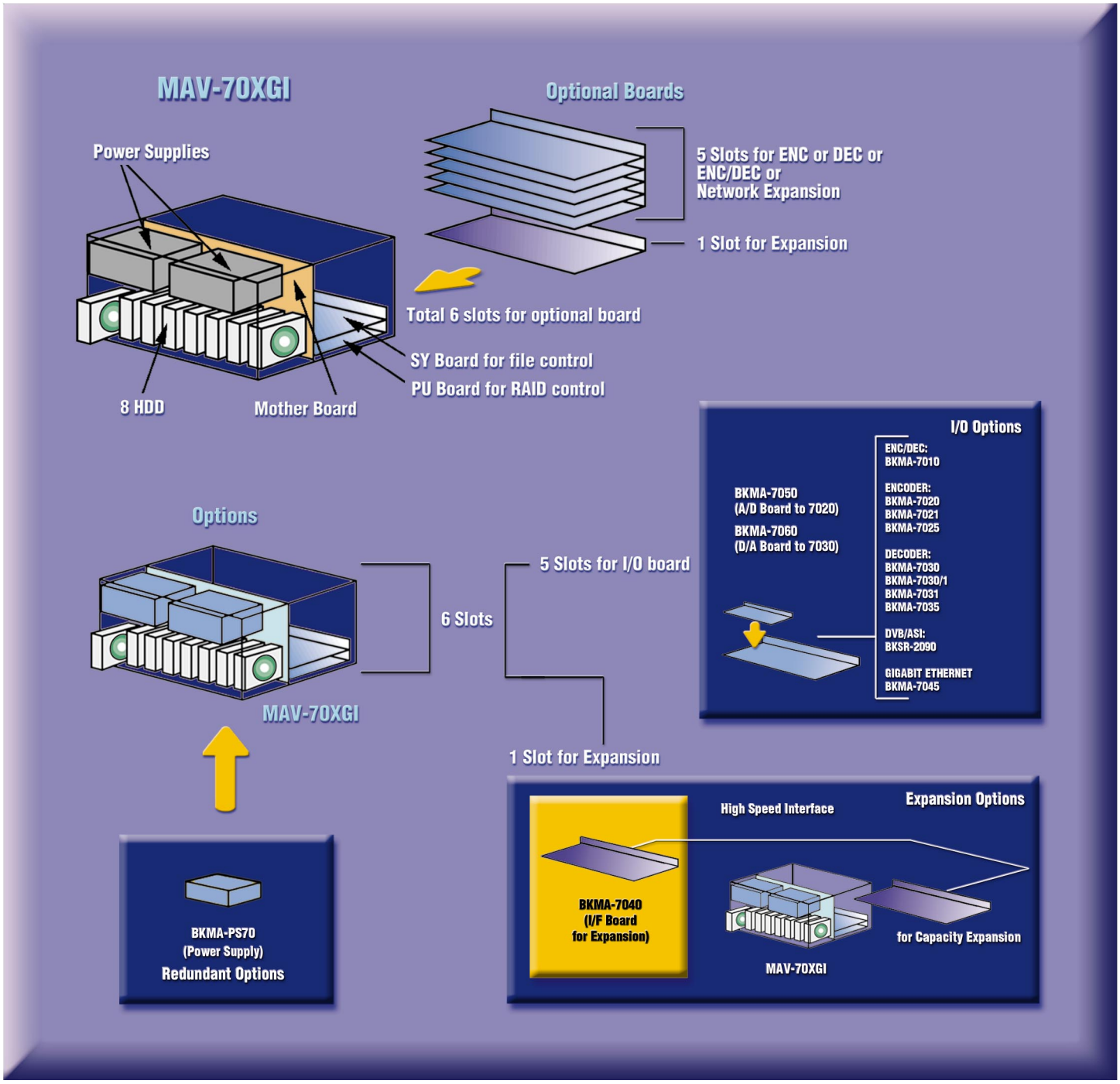
BKMA-7050, A/D Daughter Board
Used in conjunction with BKMA-7020 to accept analog PAL/NTSC signal.

BKMA-7060, D/A Daughter Board
Used in conjunction with BKMA-7030 to provide analog PAL/NTSC signal.

BKMA-7070, 100Base-T Board
Provides file transfer by 100Base-T Ethernet and is installed on the main system board. A standard 10Base-T board installed on the system board only provides File System (FS) backup/restore. The BKMA-7070 board is required for a MAV-70XGI to provide A/V file transfer and/or Telnet interface.

BKSR-2090, DVB/ASI Board
Accepts and outputs DVB/ASI signal (ISO/IEC 13818-1 compliant).

BKMA-7100, SDTI Board
Supports SDTI-CP.



MAV-70XGI Product Configuration Diagram

BKMA-PS70, Redundant PSU

Optional redundant Power Supply.

RKMA-7018D, Spare Parts (18GB HDD)

Recommended spare parts kit for 18GB HDD.

BKSH-236G, Spare Parts (36GB HDD)

Recommended spare parts kit for 36GB HDD.

Sony SupportNET™ Agreements

We are proud of our excellent hardware performance legacy. That's why Sony can protect the MAV-70XGI with a SupportNET upgraded one year on-site parts and labor warranty and a five year warranty on the hard drives. And to keep the MAV-70XGI operating at maximum potential, SupportNET agreements are renewable.

With a SupportNET agreement, you're assured of optimum performance to full specifications at a fixed price so you can control your maintenance budget. You've got priority access to product experts, up-to-date software, technical support, training programs, product guides and technical papers. And when you need immediate solutions, Sony Technical Support Engineers are available.

Technical Specifications

General

Power Requirements	AC 100 to 240V +/- 10%, 50/60 Hz
Power Consumption	620 VA
Current Consumption	7-3 A
Operating Temperature	+5˚C to +40˚C (41˚F to 104˚F)
Storage Temperature	-20˚C to +60˚C (4˚F to 140˚F)
Operation Humidity	20% to 80% (no humidity condensation)
Mass	Approx. 50kg (110lb 4oz)
Dimensions	424 x 220 x 630mm (w/h/d) (16 3/4 x 8 3/4 x 24 7/8 inches)

Characteristics

Array Composition	RAID-3 Data drives: 7 Parity drive: 1
Recorder Capacity	252 GB
Internal HDD Interface	SCSI-2 Fast/Wide single-ended, Hot-swap

Performance

Digital Video

Sampling Frequency	Y: 13.5 MHz R-Y, B-Y: 6.75 MHz
Quantization	8 bits
Compression Format	MPEG-2 4:2:2 P@ML MPEG-2 MP@ML Bit Rate: MPEG-2 MP@ML 1.5 to 15 Mb/s MPEG-2 4:2:2 P@ML 3.0 to 24 Mb/s (Long GoP) MPEG-2 4:2:2 P@ML 25 to 50 Mb/s (I-only)
Encoding Sample	Y: 720 samples/line R-Y, B-Y: 360 samples/line
Encoded Lines	525/59.94: 480 lines (NTSC) 625/50: 576 lines (PAL)
System Phase Control	+127µs to-128µs, in 37 ns steps
Video Level Control	- ∞ to +3dB
Chroma Level Control	- ∞ to +3dB
Black Level Control	±30 IRE
Hue Control	±30˚

Performance

Analog Video

Frequency Response	0.5-4.2 MHz ±0.5dB (NTSC)
S/N	0.5-4.8 MHz ±0.5dB (PAL)
K-Factor	2% or less
DG, DP	3% or less, 3˚ or less

Digital Audio

Format	AES/EBU format
Sampling Frequency	48 kHz (synchronized with video signal)
Compression Format	Linear PCM 16 bit, or MPEG-1 layer II (BKMA-7010, 7020, 7030) Linear PCM 16, 20, 24 bit, or MPEG-1 layer II (BKMA-7021, 7031)
Input/Output Channel	4 channel, non-compressed or compressed (BKMA-7010, 7020, 7030) 8 channel, non-compressed or compressed (BKMA-7021, 7031)
Frequency Response	20 Hz to 20 kHz ±0.05dB
Dynamic Range	90dB or more
Distortion	0.05% or less (1 kHz, 0dBm)
Audio Output Level Cont.	-∞ to +12dB (common to L/R)
Headroom	20dB

Analog Audio

Frequency Response	20 Hz-20 kHz ±1.0dB
Dynamic Range	90dB or more
Distortion	0.1% or less (1 kHz, +4dBm)
Cross Talk	-80dB or less

System Input/Output Block

Reference Video	Reference video input (Analog) BNC type (1 input, 1 loop-through output) Black burst signal, 0.3 Vp-p, 75 ohms
Time Code Input	Time code signal input XLR 3-pin female (1) 0.5 to 18.0 Vp-p, 10 kohms, balanced
Monitor Output	XLR 3-pin female (2) Audio output

Control

Channel Remote	5 x RS-422A ports, D-sub 9-pin (5x Remote + ISR port)
Ethernet	RJ-45 modular jack (1) Conforms to Ethernet IEEE 802.3 standards, balanced

SONY

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